as for your other results to report a single weighted value for CO_2; round CO_2 to the nearest 1 g/kW-hr.

(2) Each analyzer range that may be used during a test mode must have the zero and span responses recorded prior to the execution of the test. Only the zero and span for the range(s) used to measure the emissions during the test are required to be recorded after the completion of the test.

(3) It is permissible to change filter elements between test modes.

(4) A leak check is permitted between test segments.

(5) A hangup check is permitted between test segments.

(6) If, during the emission measurement portion of a test segment, the value of the gauges downstream of the NDIR analyzer(s) *G3* or *G4* (see Figure 1 in appendix B to subpart D) differs by more than ±0.5 kPa from the pretest value, the test segment is void.

[59 FR 31335, June 17, 1994. Redesignated and amended at 63 FR 56996, 57015, Oct. 23, 1998; 74 FR 56374, Oct. 30, 2009]

§ 89.408 Post-test procedures.

(a) A hangup check is recommended at the completion of the last test mode using the following procedure:

(1) Within 30 seconds introduce a zero-grade gas or room air into the sample probe or valve *V2* (see Figure 1 in appendix B to subpart D) to check the ''hangup zero'' response. Simultaneously start a time measurement.

(2) Select the lowest HC range used during the test.

(3) Within four minutes of beginning the time measurement in paragraph (a)(1) of this section, the difference between the span-zero response and the hangup zero response shall not be greater than 5.0 percent of full scale or 10 ppmC whichever is greater.

(b) Begin the analyzer span checks within 6 minutes after the completion of the last mode in the test. Record for each analyzer the zero and span response

(c) If during the test, the filter element(s) were replaced or cleaned, as of § 89.316(a), the test is void.

(d) Record the post-test data specified in § 89.405(f).

(e) For a valid test, the zero and span checks performed before and after each test for each analyzer must meet the following requirements:

(1) The span drift (defined as the change in the difference between the zero response and the span response) must not exceed 3 percent of full-scale chart deflection for each range used.

(2) The zero response drift must not exceed 3 percent of full-scale chart deflection.

[59 FR 31335, June 17, 1994. Redesignated and amended at 63 FR 56996, 57016, Oct. 23, 1998]

§ 89.409 Data logging.

(a) A computer or any other automatic data processing device(s) may be used as long as the system meets the requirements of this subpart.

(b) Determine from the data collection records the analyzer responses corresponding to the end of each mode.

(c) Record data at a minimum of once every 5 seconds.

(d) Determine the final value for CO_2, CO, HC, and NO_X concentrations by averaging the concentration of each point taken during the sample period for each mode.

(e) For purposes of this section, calibration data includes calibration curves, linearity curves, span-gas responses, and zero-gas responses.

[59 FR 31335, June 17, 1994. Redesignated at 63 FR 56996, Oct. 23, 1998]

§ 89.410 Engine test cycle.

(a) Emissions shall be measured using one of the test cycles specified in tables 1 through 4 of appendix B of this subpart, subject to the provisions of paragraphs (a)(1) through (a)(4) of this section. These cycles shall be used to test engines on a dynamometer.

(1) The 8-mode test cycle described in table 1 of appendix B of this subpart shall be used for all engines, except constant speed engines, engines rated under 19 kW, and propulsion marine diesel engines.

(2) The 5-mode test cycle described in table 2 of appendix B of this subpart shall be used for constant-speed engines as defined in § 89.2. Any engine certified under this test cycle must meet the labeling requirements of § 89.110(b)(11).

(3) The 6-mode test cycle described in table 3 of appendix B of this subpart